



# PRODUCT SPECIFICATIONS

For Customer: \_\_\_\_\_  : APPROVAL FOR SPECIFICATION

Customer Model No. \_\_\_\_\_  : APPROVAL FOR SAMPLE

Module No.: LW043DDRN2-01      Version: V1.0      Date : 2017-09-29

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## For Customer's Acceptance:

Approved By	Comment

PREPARED	CHECKED	VERIFIED BY QA DEPT	VERIFIED BY R&D DEPT
Tony	Steven		



## 2. Revision Record

Date	Rev.No.	Page	Revision Items	Prepared
2017-09-29	V1.0		The first release	Tony



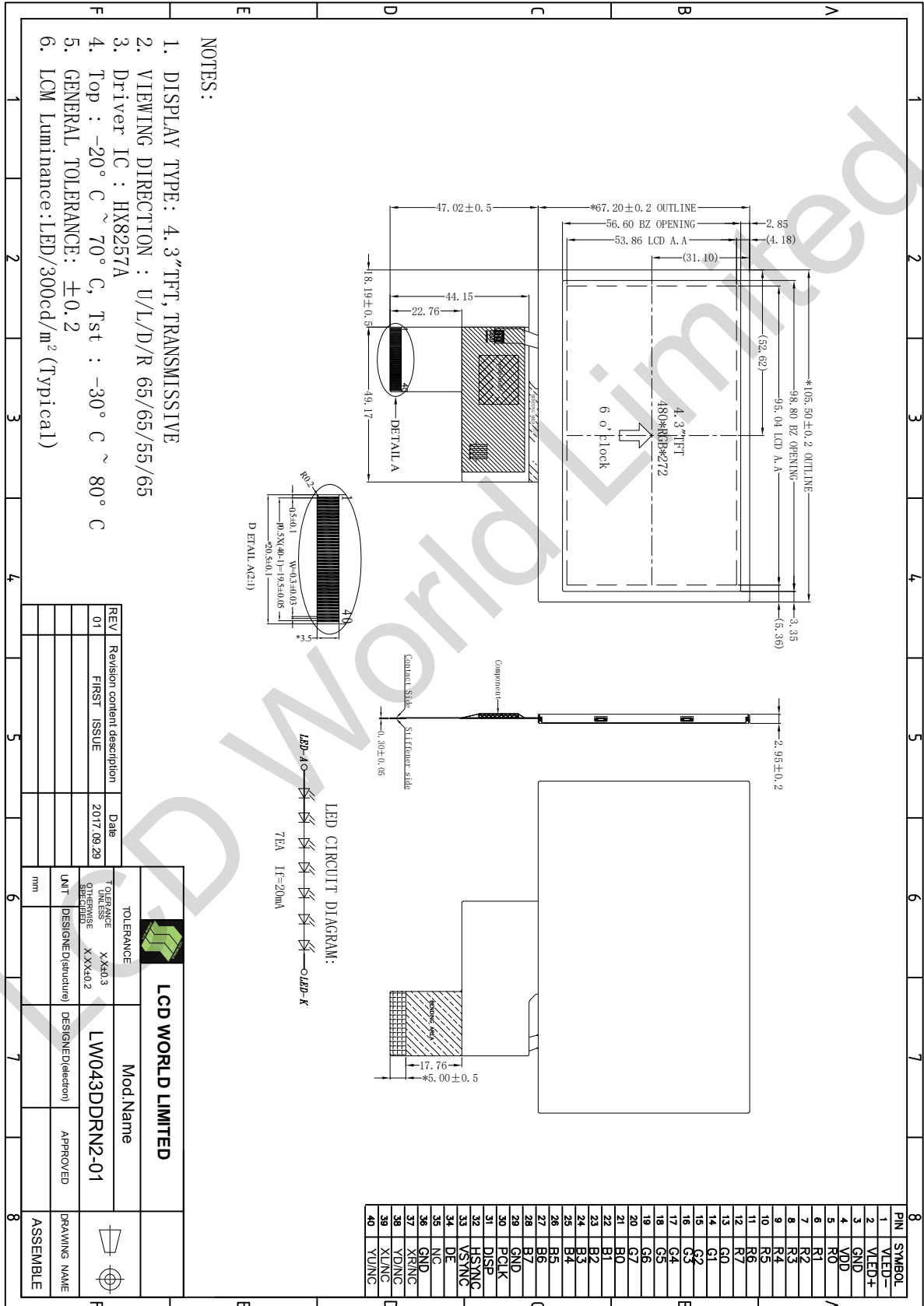
### 3. General Specifications

LW043DDRN2-01 is a TFT-LCD module. It is composed of a TFT-LCD panel, driver IC, FPC , backlight unit. The 4.3" display area contains 480 x 272 pixels and can display up to 16.7M colors. This product accords with RoHS environmental criterion

Item	Contents	Unit	Note
LCD Type	TFT	-	
Display Mode	TN Normally White Transmissive		
Gray Scale Inversion Direction	12:00	O'clock	
Best Viewing Direction	6:00	O'clock	
Surface treatment	-	-	
Drive IC	HX8257A	-	
Power Supply for LCD	3.3	V	
Interface	24Bits-RGB	-	
Outline Dimensions	105.50*67.20*2.95	mm	
Active Area(W×H)	95.04*53.86	mm	
Pixel Pitch(W×H)	0.198*0.198	mm	
Number of Dots	480(RGB)×272	dots	
Backlight	7-LEDs (white)	pcs	
Luminance for LCM	300	Cd/m2	
Weight	-	G	
Touch Panel	-	-	
Operating temperature	-20~+70	°C	
Storage temperature	-30~+80	°C	



### 4. Outline Drawing

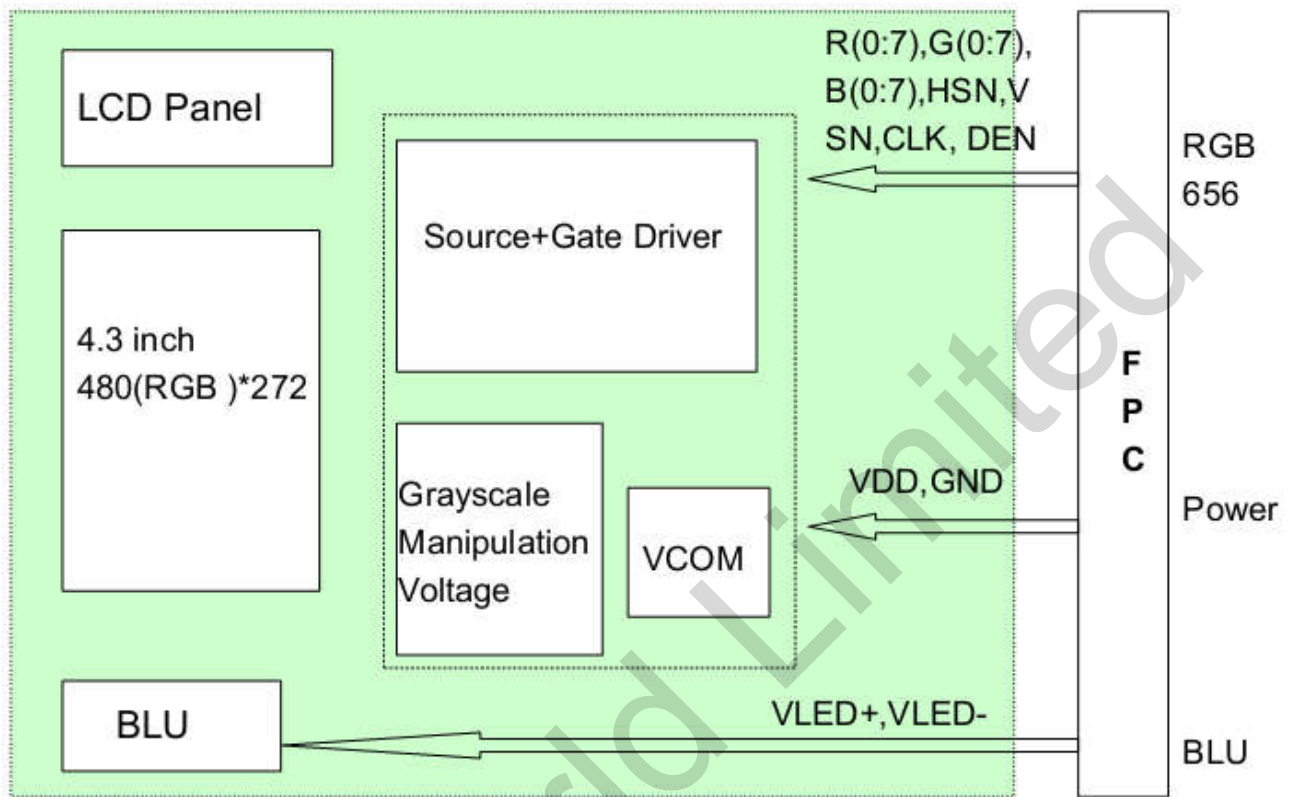


**4.1 Interface Signals**

Pin No.	Symbol	I/O	Function
1	VLED-	P	LED back light(Cathode)
2	VLED+	P	LED back light(Anode)
3	GND	P	Ground.
4	VDD	P	Power supply
5-12	R0~R7	I	Red data bus
13-20	G0~G7	I	Green data bus
21-28	B0~B7	I	Blue data bus
29	GND		Ground.
30	PCLK	I	Data clock
31	DISP	I	Normal display and Standby mode select pin
32	HSYNC	I	Line sync signal
33	VSYNC	I	Frame sync signal
34	DE	I	Data enable pin
35	NC		No connection.
36	GND	P	Ground.
37	XR/NC	O	Touch Panel Control pin
38	YD/NC	O	
39	XL/NC	O	
40	YU/NC	O	



### 5、 Operation Specifications



#### 5. 1 Absolute Maximum Ratings(Ta=25°C)

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	VDD	-0.3	5	V	1,2
Operating Temperature	Top	-20	70	°C	3
Storage Temperature	Tst	-30	80	°C	4

Notes:

1. If the module is above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability.
2. VDD >VSS must be maintained.
3. The response time will become lower when operated at low temperature. The background color changes slightly depending on ambient temperature. The phenomenon is reversible.
4. Ta<=40°C:85%RH MAX.  
Ta>=40°C:Absolute humidity must be lower than the humidity of 85%RH at 40°C.



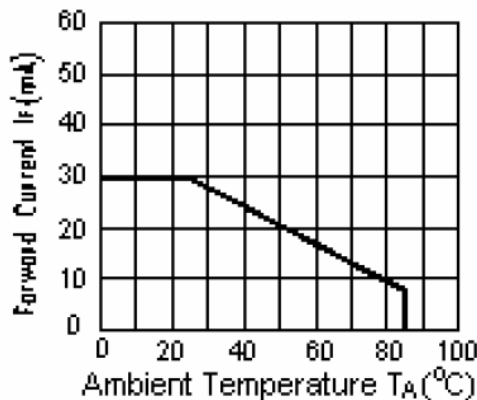
### 5.2 Electrical characteristics (Ta=25°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Power supply	VDD	Ta=25°C	3.0	3.3	3.6	V	
Input voltage	'H'	V <sub>IH</sub>	V <sub>DD</sub> =3.3V	0.8V <sub>DD</sub>	-	V <sub>DD</sub>	V
	'L'	V <sub>IL</sub>	V <sub>DD</sub> =3.3V	0	-	0.2V <sub>DD</sub>	V
Current Consumption	I <sub>CC1</sub>	Normal mode	-	13	25	mA	
	I <sub>CC2</sub>	Sleep mode	-	0.05	0.1	mA	
Clock Frequency	f <sub>CLK</sub>	-	-	9	12	MHz	

### 5.3 LED backlight specification (Ta=25°C, 60%RH±5%)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
LED Current	I <sub>LED</sub>		20	25	mA	Total LED
Forward Voltage	V <sub>F</sub>	-	22.4	23.1	V	I <sub>F</sub> =20mA
Power Dissipation	P <sub>d</sub>	-	448	525	mW	Total LED
Backlight Lifetime		25000(TYP)			Hour	

Note: Backlight lifetime means brightness goes down to 50% initial brightness;  
 The lifetime of LED will be reduced if LED is driven by high current, high ambient temperature and humidity conditions;  
 Typical lifetime is an estimated data.





## 6. Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
Brightness	Bp	$\theta=0^\circ$ $\Phi=0^\circ$	-	300	-	Cd/m <sup>2</sup>	1	
Uniformity	$\Delta$ Bp		75	-	-	%	1,2	
Viewing Angle	3:00	Cr $\geq$ 10	-	65	-	Deg	3	
	6:00		-	55	-			
	9:00		-	65	-			
	12:00		-	65	-			
Contrast Ratio	Cr		350	500	-	-	4	
Response Time	T <sub>r</sub>	$\theta=0^\circ$ $\Phi=0^\circ$	-	10	-	ms	5	
	T <sub>f</sub>		-	10	-	ms		
Color of CIE Coordinate	W	x	-	0.28	-	-	1,6	
		y	-	0.33	-	-		
	R	x	-	0.51	-	-		
		y	-	0.34	-	-		
	G	x	$\theta=0^\circ$ $\Phi=0^\circ$	-	0.31	-		-
		y	-	0.56	-	-		
	B	x	-	0.15	-	-		
		y	-	0.14	-	-		
NTSC Ratio	S		50	60	-	%		

Note: The parameter is slightly changed by temperature, driving voltage and materiel

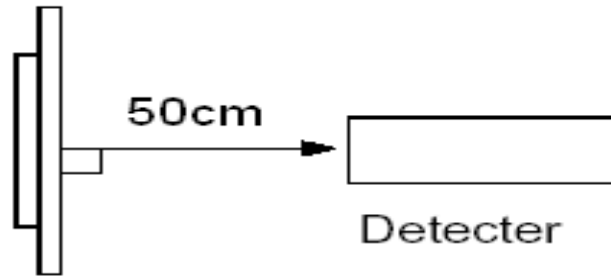
Note 1: The data are measured after LEDs are turned on for 5 minutes. LCM displays full white. The brightness is the average value of 9 measured spots.

Measuring condition:

- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25°C.
- Adjust operating voltage to get optimum contrast at the center of the display.

Measured value at the center point of LCD panel after more than 5 minutes while backlight turning on.



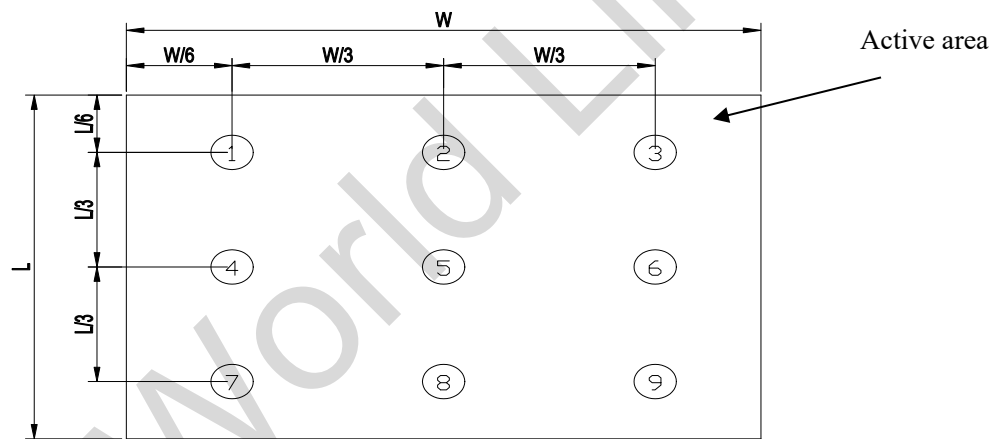


Note 2: The luminance uniformity is calculated by using following formula.

$$\Delta B_p = B_p (\text{Min.}) / B_p (\text{Max.}) \times 100 (\%)$$

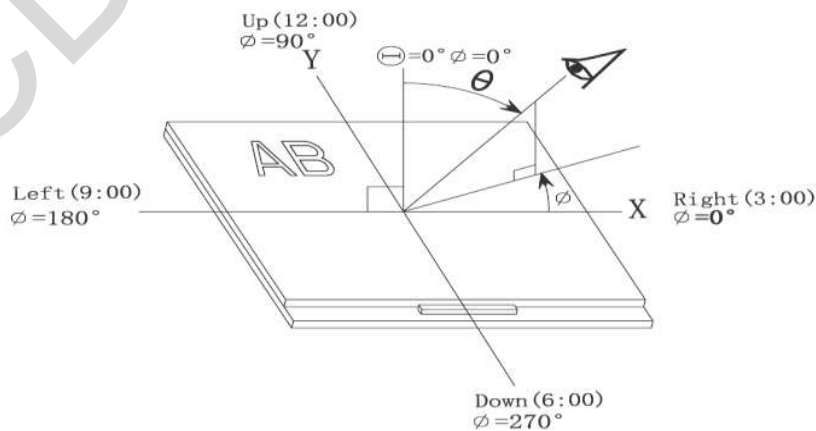
$B_p (\text{Max.})$  = Maximum brightness in 9 measured spots

$B_p (\text{Min.})$  = Minimum brightness in 9 measured spots.



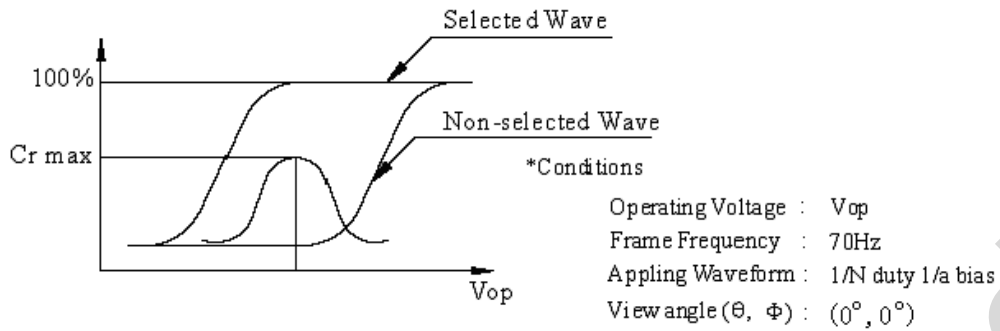
Note 3: The definition of viewing angle:

Refer to the graph below marked by  $\theta$  and  $\phi$





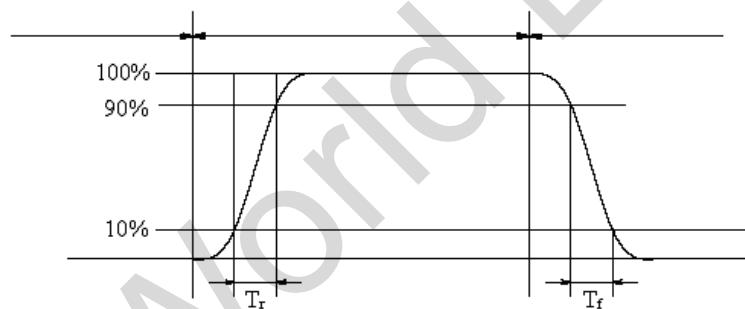
Note 4: Definition of contrast ratio.



$$\text{Contrast ratio (Cr)} = \frac{\text{Brightness of selected dots}}{\text{Brightness of non-selected dots}}$$

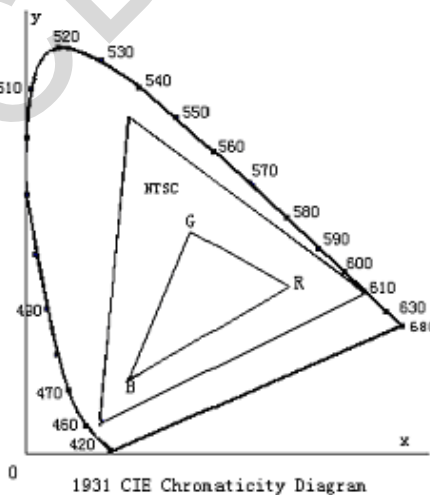
Note 5: Definition of Response time.

The output signals of photo detector are measured when the input signals are changed from "black" to "white"(falling time) and from "white" to "black"(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as below.



The definition of response time

Note 6: Definition of Color of CIE Coordinate and NTSC Ratio.



Color gamut:

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$



### 7. Reliability Test Items and Criteria

No	Test Item	Test condition	Criterion
1	High Temperature Storage	80°C±2°C 96H Restore 2H at 25°C Power off	Note
2	Low Temperature Storage	-30°C±2°C 96H Restore 2H at 25°C Power off	
3	High Temperature Operation	70°C±2°C96H Restore 2H at 25°C Power on	
4	Low Temperature Operation	-20°C±2°C96H Restore 4H at 25°C Power on	
5	High Temperature and Humidity Operation	40°C±2°C 85%RH 96H Power on	
6	Thermal Shock	-10°C →+25°C →+50°C, 100 cycles 30min 5min 30min Restore 2H at 25°C Power off	
7	Vibration Test	10Hz~150Hz, 100m/s <sup>2</sup> , 120min	
8	Shock Test	Half- sine wave,300m/s <sup>2</sup> ,11ms	



## 8. Precautions for Use of LCD Modules

### 8.1 Handling Precautions

- 8.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- 8.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.
- 8.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- 8.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.
- 8.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:
  - Isopropyl alcohol
  - Ethyl alcoholSolvents other than those mentioned above may damage the polarizer. Especially, do not use the following:
  - Water
  - Ketone
  - Aromatic solvents
- 8.1.6 Do not attempt to disassemble the LCD Module.
- 8.1.7 If the logic circuit power is off, do not apply the input signals.
- 8.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
  - a. Be sure to ground the body when handling the LCD Modules.
  - b. Tools required for assembly, such as soldering irons, must be properly ground.
  - c. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
  - d. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

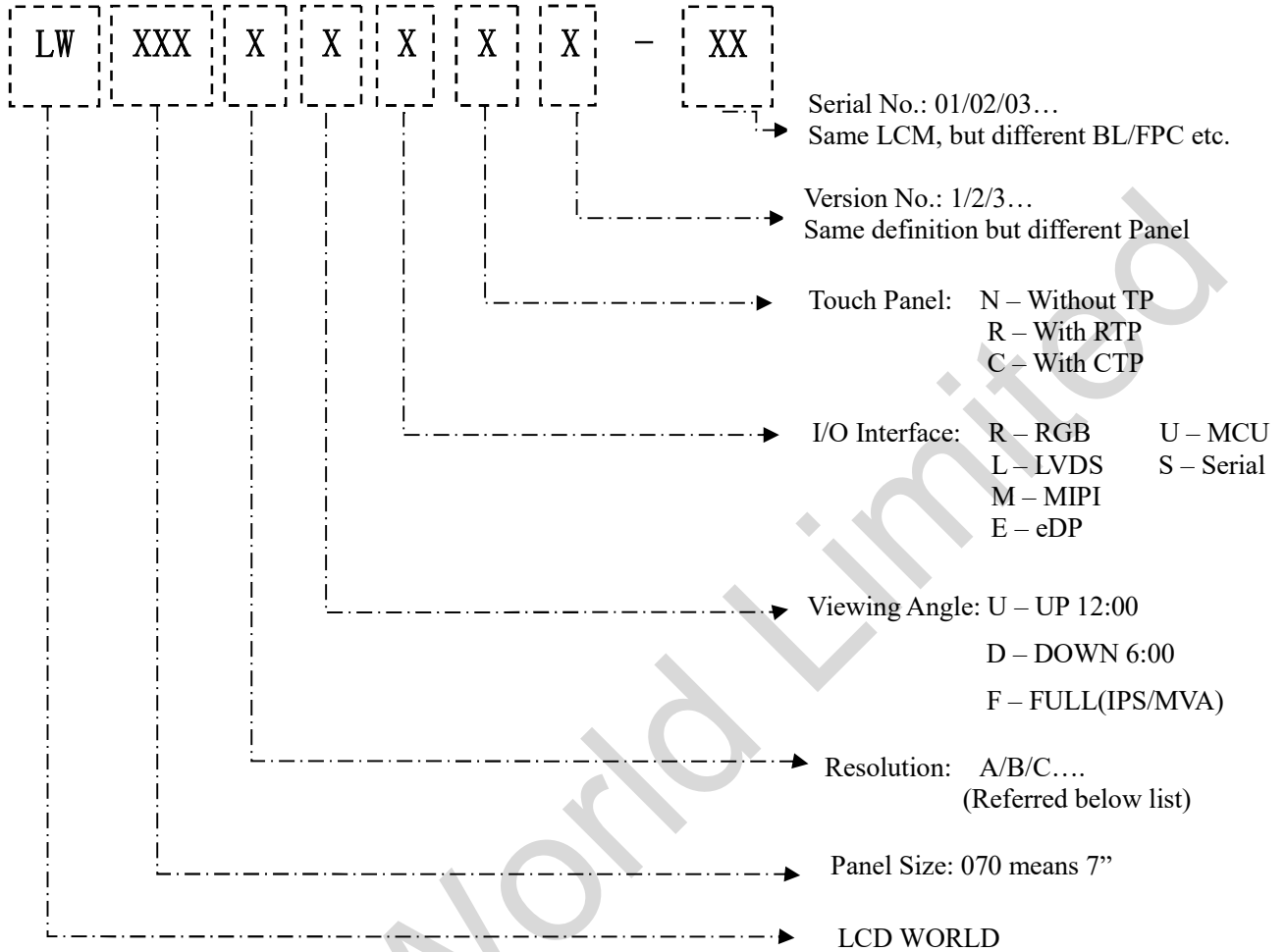
### 8.2 Storage precautions

- 8.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.
- 8.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:
  - Temperature : 0°C ~ 40°C
  - Relatively humidity: ≤80%
- 8.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

- 8.3 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.



### 9. LCDW P/N Coding System



	Resolution	Code
QQVGA	128*160	A
QCIF	176*220	B
QVGA	320*240	C
WQVGA	272*480	D
HVGA	320*480	E
VGA	480*640	F
WVGA	800*480	G
SVGA	800*600	H
WSVGA	1024*600	J
XGA	1024*768	K
HD	1280*720	L
WXGA	1280*800	M
SXGA	1280*960	N
WSXGA	1680*1024	P
UGA	1600*1200	Q
FHD	1920*1080	R
WUXGA	1920*1200	S

END